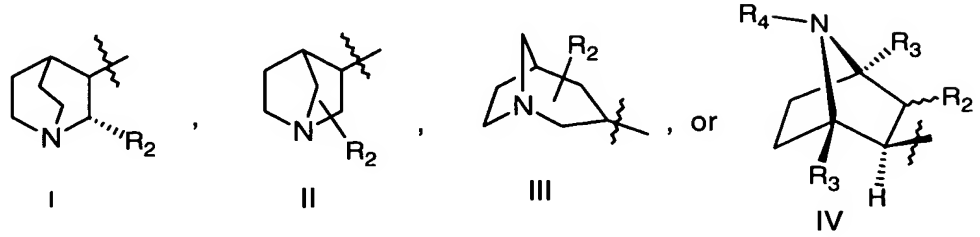
Claims:

1. A compound of Formula I:

Azabicyclo-N(R_1)-C(=O)-W

Formula I

wherein Azabicyclo is



I , II , III , or IV

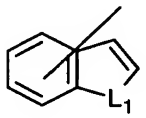
R_1 is H;

R_2 is H or alkyl;

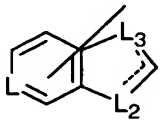
Each R_3 is independently H, alkyl, or substituted alkyl;

R_4 is H, alkyl, an amino protecting group, or an alkyl group having 1-3 substituents selected from F, Cl, Br, I, -OH, -CN, $-NH_2$, -NH(alkyl), or $-N(alkyl)_2$;

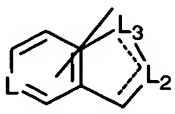
R_5 is 5-membered heteroaromatic mono-cyclic moieties containing within the ring 1-3 heteroatoms independently selected from the group consisting of -O-, =N-, $-N(R_{10})-$, and -S-, and having 0-1 substituent selected from R_9 and further having 0-3 substituents independently selected from F, Cl, Br, or I, or R_5 is 9-membered fused-ring moieties having a 6-membered ring fused to a 5-membered ring and having the formula



wherein L_1 is O, S, or NR_{10},



wherein L is CR_{12} or N, L_2 and L_3 are independently selected from CR_{12}, $C(R_{12})_2$, O, S, N, or NR_{10}, provided that both L_2 and L_3 are not simultaneously O, simultaneously S, or simultaneously O and S, or



wherein L is CR_{12} or N, and L_2 and L_3 are independently selected from CR_{12}, O, S, N, or NR_{10}, and each 9-membered fused-ring moiety having 0-1 substituent selected from R_9 and further having 0-3 substituent(s) independently selected from F, Cl, Br, or I, wherein the R_5 moiety attaches to other substituents as defined in formula I at any position as valency allows;

R_6 is 6-membered heteroaromatic mono-cyclic moieties containing within the ring 1-3 heteroatoms selected from =N- and having 0-1 substituent selected from R_9 and 0-3 substituent(s) independently selected from F, Cl, Br, or I, or R_6 is 10-membered heteroaromatic bi-cyclic moieties containing within one or both rings 1-3 heteroatoms selected from =N-, including, but not limited to, quinolinyl or isoquinolinyl, each 10-membered fused-ring moiety having 0-1 substituent selected from R_9 and 0-3 substituent(s) independently selected from F, Cl, Br, or I, wherein the R_6 moiety attaches to other substituents as defined in formula I at any position as valency allows;

R_7 is alkyl, substituted alkyl, haloalky, $-OR_{11}$, -CN, $-NO_2$, $-N(R_8)_2$;

Each R_8 is independently H, alkyl, cycloalkyl, heterocycloalkyl, alkyl substituted with 1 substituent selected from R_{13}, cycloalkyl substituted with 1 substituent selected from R_{13}, heterocycloalkyl substituted with 1 substituent selected from R_{13}, haloalkyl, halocycloalkyl, haloheterocycloalkyl, phenyl, or substituted phenyl;

R_9 is alkyl, cycloalkyl, heterocycloalkyl, haloalkyl, halocycloalkyl, haloheterocycloalkyl, $-OR_{14}$, $-SR_{14}$, $-N(R_{14})_2$, $-C(O)R_{14}$, $-C(O)N(R_{14})_2$, -CN, $-NR_{14}C(O)R_{14}$, $-S(O)_2N(R_{14})_2$, $-NR_{14}S(O)_2R_{14}$, $-NO_2$, alkyl substituted with 1-4 substituent(s) independently selected from F, Cl, Br, I, or R_{13}, cycloalkyl substituted with 1-4 substituent(s) independently selected from F, Cl, Br, I, or R_{13}, or heterocycloalkyl substituted with 1-4 substituent(s) independently selected from F, Cl, Br, I, or R_{13};

R_{10} is H, alkyl, haloalkyl, substituted alkyl, cycloalkyl, halocycloalkyl, substituted cycloalkyl, phenyl, or phenyl having 1 substituent selected from R_7 and further having 0-3 substituents independently selected from F, Cl, Br, or I;

Each R_{11} is independently H, alkyl, cycloalkyl, heterocycloalkyl, haloalkyl, halocycloalkyl, or haloheterocycloalkyl;

Each R_{12} is independently H, F, Cl, Br, I, alkyl, cycloalkyl, heterocycloalkyl, haloalkyl, halocycloalkyl, haloheterocycloalkyl, substituted alkyl, substituted cycloalkyl, substituted heterocycloalkyl, -CN, -NO_2, -OR_{14}, -SR_{14}, -$N(R_{14})_2$, -$C(O)R_{14}$, -$C(O)N(R_{14})_2$, -$NR_{14}C(O)R_{14}$, -$S(O)_2N(R_{14})_2$, -$NR_{14}S(O)_2RR_{14}$, or a bond directly or indirectly attached to the core molecule, provided that there is only one said bond to the core molecule within the 9-membered fused-ring moiety, further provided that where valency allows the fused-ring moiety has 0-1 substituent selected from alkyl, cycloalkyl, heterocycloalkyl, haloalkyl, halocycloalkyl, haloheterocycloalkyl, substituted alkyl, substituted cycloalkyl, substituted heterocycloalkyl, -OR_{14}, -SR_{14}, -$N(R_{14})_2$, -$C(O)R_{14}$, -NO_2, -$C(O)N(R_{14})_2$, -CN, -$NR_{14}C(O)R_{14}$, -$S(O)_2N(R_{14})_2$, or -$NR_{14}S(O)_2R_{14}$, and further provided that the fused-ring moiety has 0-3 substituent(s) selected from F, Cl, Br, or I;

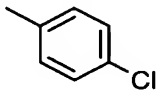
R_{13} is -OR_{14}, -SR_{14}, -$N(R_{14})_2$, -$C(O)R_{14}$, -$C(O)N(R_{14})_2$, -CN, -CF_3, -$NR_{14}C(O)R_{14}$, -$S(O)_2N(R_{14})_2$, -$NR_{14}S(O)_2R_{14}$, or -NO_2;

Each R_{14} is independently H, alkyl, cycloalkyl, heterocycloalkyl, haloalkyl, halocycloalkyl, or haloheterocycloalkyl;

wherein W is (A):

(A-1)

or



(A-2)

R_{A-1a} is H, alkyl, alkenyl, alkynyl, cycloalkyl, heterocycloalkyl, haloalkyl, haloalkenyl, haloalkynyl, halocycloalkyl, haloheterocycloalkyl, substituted alkyl, substituted alkenyl, substituted alkynyl, substituted cycloalkyl, substituted heterocycloalkyl, aryl, -R_5, R_6, -OR_{A-3}, -OR_{A-4}, -SR_{A-3}, F, Cl, Br, I, -$N(R_{A-3})_2$, -$N(R_{A-5})_2$, -$C(O)R_{A-3}$, -$C(O)R_{A-5}$, -CN, -$C(O)N(R_{A-3})_2$, -$C(O)N(R_{A-6})_2$, -$NR_{A-3}C(O)R_{A-3}$, -$S(O)R_{A-3}$, -$OS(O)_2R_{A-3}$, -$NR_{A-3}S(O)_2R_{A-3}$, -NO_2, and -$N(H)C(O)N(H)R_{A-3}$;

R_{A-1b} is -O-R_{A-3}, -S-R_{A-3}, -S(O)-R_{A-3}, -C(O)-R_{A-7}, and alkyl substituted on the ω carbon with R_{A-7};

Each R_{A-3} is independently selected from H, alkyl, haloalkyl, substituted alkyl, cycloalkyl, halocycloalkyl, substituted cycloalkyl, heterocycloalkyl,

haloheterocycloalkyl, substituted heterocycloalkyl, R_5, R_6, phenyl, or substituted phenyl;

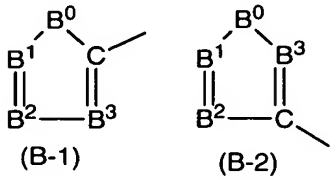
R_{A-4} is selected from cycloalkyl, halocycloalkyl, substituted cycloalkyl, heterocycloalkyl, haloheterocycloalkyl, or substituted heterocycloalkyl;

Each R_{A-5} is independently selected from cycloalkyl, halocycloalkyl, substituted cycloalkyl, heterocycloalkyl, haloheterocycloalkyl, substituted heterocycloalkyl, R_5, R_6, phenyl, or substituted phenyl;

Each R_{A-6} is independently selected from alkyl, haloalkyl, substituted alkyl, cycloalkyl, halocycloalkyl, substituted cycloalkyl, heterocycloalkyl, haloheterocycloalkyl, substituted heterocycloalkyl, R_5, R_6, phenyl, or substituted phenyl;

R_{A-7} is selected from aryl, R_5, or R_6;

wherein W is (B):



B^0 is -O-, -S-, or -N(R_{B-0})-;

B^1 and B^2 are independently selected from =N-, or =C(R_{B-1})-;

B^3 is =N-, or =CH-, provided that when both B^1 and B^2 are =C(R_{B-1})- and B^3 is =CH-, only one =C(R_{B-1})- can be =CH-, and further provided that when B^0 is -O-, B^2 is =C(R_{B-1})- and B^3 is =C(H)-, B^1 cannot be =N-,

R_{B-0} is H, alkyl, cycloalkyl, heterocycloalkyl, haloalkyl, halocycloalkyl, haloheterocycloalkyl, substituted alkyl, limited substituted alkyl, substituted cycloalkyl, substituted heterocycloalkyl, or aryl, and provided that when B is (B-2) and B^3 is =N- and B^0 is N(R_{B-0}), R_{B-0} cannot be phenyl or substituted phenyl;

R_{B-1} is H, alkyl, alkenyl, alkynyl, cycloalkyl, heterocycloalkyl, haloalkyl, haloalkenyl, haloalkynyl, halocycloalkyl, haloheterocycloalkyl, substituted alkyl, substituted alkenyl, substituted alkynyl, substituted cycloalkyl, substituted heterocycloalkyl, limited substituted alkyl, limited substituted alkenyl, limited substituted alkynyl, aryl, -OR_{B-2}, -OR_{B-3}, -SR_{B-2}, -SR_{B-3}, F, Cl, Br, I, -$N(R_{B-2})_2$, -$N(R_{B-3})_2$, -$C(O)R_{B-2}$, -$C(O)R_{B-3}$, -$C(O)N(R_{B-2})_2$, -$C(O)N(R_{B-3})_2$, -CN,

$-NR_{B-2}C(O)R_{B-4}$, $-S(O)_2N(R_{B-2})_2$, $-OS(O)_2R_{B-4}$, $-S(O)_2R_{B-2}$, $-S(O)_2R_{B-3}$, $-NR_{B-2}S(O)_2R_{B-2}$, $-N(H)C(O)N(H)R_{B-2}$, $-NO_2$, R_5, and R_6;

Each R_{B-2} is independently H, alkyl, haloalkyl, substituted alkyl, cycloalkyl, halocycloalkyl, substituted cycloalkyl, heterocycloalkyl, haloheterocycloalkyl, substituted heterocycloalkyl, R_5, R_6, phenyl, or substituted phenyl;

Each R_{B-3} is independently H, alkyl, haloalkyl, limited substituted alkyl, cycloalkyl, halocycloalkyl, substituted cycloalkyl, heterocycloalkyl, haloheterocycloalkyl, substituted heterocycloalkyl;

R_{B-4} is independently H, alkyl, cycloalkyl, heterocycloalkyl, haloalkyl, halocycloalkyl, or haloheterocycloalkyl;

wherein W is (C):

(C) is a six-membered heterocyclic ring system having 1-2 nitrogen atoms or a 10-membered bicyclic-six-six-fused-ring system having up to two nitrogen atoms within either or both rings, provided that no nitrogen is at a bridge of the bicyclic-six-six-fused-ring system, and further having 1-2 substitutents independently selected from R_{C-1};

Each R_{C-1} is independently H, F, Cl, Br, I, alkyl, haloalkyl, substituted alkyl, alkenyl, haloalkenyl, substituted alkenyl, alkynyl, haloalkynyl, substituted alkynyl, cycloalkyl, halocycloalkyl, substituted cycloalkyl, heterocycloalkyl, haloheterocyloalkyl, substituted heterocycloalkyl, lactam heterocycloalkyl, phenyl, substituted phenyl, $-NO_2$, -CN, $-OR_{C-2}$, $-SR_{C-2}$, $-SOR_{C-2}$, $-SO_2R_{C-2}$, $-NR_{C-2}C(O)R_{C-3}$, $-NR_{C-2}C(O)R_{C-2}$, $-NR_{C-2}C(O)R_{C-4}$, $-N(R_{C-2})_2$, $-C(O)R_{C-2}$, $-C(O)_2R_{C-2}$, $-C(O)N(R_{C-2})_2$, -SCN, $-NR_{C-2}C(O)R_{C-2}$, $-S(O)N(R_{C-2})_2$, $-S(O)_2N(R_{C-2})_2$, $-NR_{C-2}S(O)_2R_{C-2}$, R_5, or R_6;

Each R_{C-2} is independently H, alkyl, cycloalkyl, heterocycloalkyl, alkyl substituted with 1 substituent selected from R_{C-5}, cycloalkyl substituted with 1 substituent selected from R_{C-5}, heterocycloalkyl substituted with 1 substituent selected from R_{C-5}, haloalkyl, halocycloalkyl, haloheterocycloalkyl, phenyl, or substituted phenyl;

Each R_{C-3} is independently H, alkyl, or substituted alkyl;

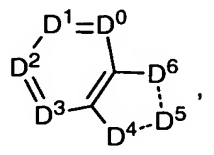
R_{C-4} is H, alkyl, an amino protecting group, or an alkyl group having 1-3 substituents selected from F, Cl, Br, I, -OH, -CN, $-NH_2$, -NH(alkyl), or $-N(alkyl)_2$;

R_{C-5} is -CN, $-CF_3$, $-NO_2$, $-OR_{C-6}$, $-SR_{C-6}$, $-N(R_{C-6})_2$, $-C(O)R_{C-6}$, $-SOR_{C-6}$,

$-SO_2RR_{C-6}$, $-C(O)N(R_{C-6})_2$, $-NR_{C-6}C(O)R_{C-6}$, $-S(O)_2N(R_{C-6})_2$, or $-NR_{C-6}S(O)_2R_{C-6}$;

Each R_{C-6} is independently H, alkyl, cycloalkyl, heterocycloalkyl, haloalkyl, halocycloalkyl, or haloheterocycloalkyl;

wherein W is (D):



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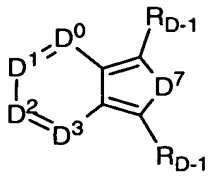

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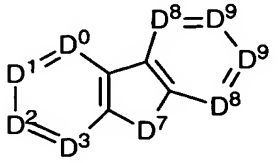


provided that the bond between the -C(=X)- group and the W group may be attached at any available carbon atom within the D group as provided in R_{D-1}, R_{D-3}, and R_{D-4};

D^0, D^1, D^2, and D^3 are N or $C(R_{D-1})$ provided that up to one of D^0, D^1, D^2, or D^3 is N and the others are $C(R_{D-1})$, further provided that when C(X) is attached at D^2 and D^0 or D^1 is N, D^3 is C(H), and further provided that there is only one attachment to C(X);

D^4---D^5---D^6 is selected from $N(R_{D-2})$-$C(R_{D-3})$=$C(R_{D-3})$, N=$C(R_{D-3})$-$C(R_{D-4})_2$, $C(R_{D-3})$=$C(R_{D-3})$-$N(R_{D-2})$, $C(R_{D-3})_2$-$N(R_{D-2})$-$C(R_{D-3})_2$, $C(R_{D-4})_2$-$C(R_{D-3})$=N, $N(R_{D-2})$-$C(R_{D-3})_2$-$C(R_{D-3})_2$, $C(R_{D-3})_2$-$C(R_{D-3})_2$-$N(R_{D-2})$, O-$C(R_{D-3})$=$C(R_{D-3})$, O-$C(R_{D-3})_2$-$C(R_{D-3})_2$, $C(R_{D-3})_2$-O-$C(R_{D-3})_2$, $C(R_{D-3})$=$C(R_{D-3})$-O, $C(R_{D-3})_2$-$C(R_{D-3})_2$-O, S-$C(R_{D-3})$=$C(R_{D-3})$, S-$C(R_{D-3})_2$-$C(R_{D-3})_2$, $C(R_{D-3})_2$-S-$C(R_{D-3})_2$, $C(R_{D-3})$=$C(R_{D-3})$-S, or $C(R_{D-3})_2$-$C(R_{D-3})_2$-S;

provided that when C(X) is attached to W at D^2 and D^6 is O, $N(R_{D-2})$, or S, D^4---D^5 is not CH=CH;

and further provided that when C(X) is attached to W at D^2 and D^4 is O, $N(R_{D-2})$, or S, D^5---D^6 is not CH=CH;

Each R_{D-1} is independently H, F, Br, I, Cl, -CN, $-CF_3$, $-OR_{D-5}$, $-SR_{D-5}$, $-N(R_{D-5})_2$, or a bond to C(X) provided that only one R_{D-1} and no R_{D-3} or R_{D-4} is said bond,

Each R_{D-2} is independently H, alkyl, haloalkyl, substituted alkyl, cycloalkyl, halocycloalkyl, substituted cycloalkyl, heterocycloalkyl, haloheterocycloalkyl, substituted heterocycloalkyl, R_5, or R_6;

Each R_{D-3} is independently H, F, Br, Cl, I, alkyl, substituted alkyl, haloalkyl, alkenyl, substituted alkenyl, haloalkenyl, alkynyl, substituted alkynyl, haloalkynyl, heterocycloalkyl, substituted heterocycloalkyl, lactam heterocycloalkyl, -CN, $-NO_2$, $-OR_{D-10}$, $-C(O)N(R_{D-11})_2$, $-NR_{D-10}COR_{D-12}$, $-N(R_{D-10})_2$, $-SR_{D-10}$, $-S(O)_2R_{D-10}$, $-C(O)R_{D-12}$, $-CO_2R_{D-10}$, aryl, R_5, R_6,or a bond to C(X) provided that only one R_{D-3} and no R_{D-1} or R_{D-4} is also said bond;

Each R_{D-4} is independently H, F, Br, Cl, I, alkyl, substituted alkyl, haloalkyl, alkenyl, substituted alkenyl, haloalkenyl, alkynyl, substituted alkynyl, haloalkynyl, heterocycloalkyl, substituted heterocycloalkyl, lactam heterocycloalkyl, -CN, $-NO_2$, $-OR_{D-10}$, $-C(O)N(R_{D-11})_2$, $-NR_{D-10}COR_{D-12}$, $-N(R_{D-11})_2$, $-SR_{D-10}$, $-CO_2R_{D-10}$, aryl, R_5, R_6, or a bond to C(X) provided that only one R_{D-4} and no R_{D-1} or R_{D-3} is also said bond;

Each R_{D-5} is independently H, C_{1-3} alkyl, or C_{2-4} alkenyl;

D^7 is O, S, or $N(R_{D-2})$;

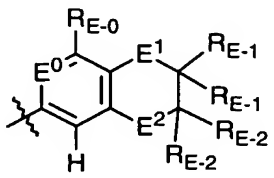
D^8 and D^9 are $C(R_{D-1})$, provided that when C(X) is attached at a D^9, each D^8 is CH;

Each R_{D-10} is H, alkyl, cycloalkyl, haloalkyl, substituted phenyl, or substituted naphthyl;

Each R_{D-11} is independently H, alkyl, cycloalkyl, heterocycloalkyl, alkyl substituted with 1 substituent selected from R_{13}, cycloalkyl substituted with 1 substituent selected from R_{13}, heterocycloalkyl substituted with 1 substituent selected from R_{13}, haloalkyl, halocycloalkyl, haloheterocycloalkyl, phenyl, or substituted phenyl;

R_{D-12} is H, alkyl, substituted alkyl, cycloalkyl, haloalkyl, heterocycloalkyl, substituted heterocycloalkyl, substituted phenyl, or substituted naphthyl;

wherein W is (E):



E^0 is CH or N;

R_{E-0} is H, F, Cl, Br, I, alkyl, alkenyl, alkynyl, cycloalkyl, heterocycloalkyl, haloalkyl, haloalkenyl, haloalkynyl, halocycloalkyl, haloheterocycloalkyl, substituted alkyl, substituted alkenyl, substituted alkynyl, substituted cycloalkyl, substituted heterocycloalkyl, aryl, R_5, R_6, $-OR_{E-3}$, $-OR_{E-4}$, $-SR_{E-3}$, $-SR_{E-5}$, $-N(R_{E-3})_2$, $-NR_{E-3}R_{E-6}$, $-N(R_{E-6})_2$, $-C(O)R_{E-3}$, -CN, $-C(O)N(R_{E-3})_2$, $-NR_{E-3}C(O)R_{E-3}$, $-S(O)R_{E-3}$, $-S(O)R_{E-5}$, $-OS(O)_2R_{E-3}$, $-NR_{E-3}S(O)_2R_{E-3}$, $-NO_2$, or $-N(H)C(O)N(H)R_{E-3}$;

E^1 is O, CR_{E-1-1}, or $C(R_{E-1-1})_2$, provided that when E^1 is CR_{E-1-1}, one R_{E-1} is a bond to CR_{E-1-1}, and further provided that at least one of E^1 or E^2 is O;

Each R_{E-1-1} is independently H, F, Br, Cl, CN, alkyl, haloalkyl, substituted alkyl, alkynyl, cycloalkyl, $-OR_E$, or $-N(R_E)_2$, provided that at least one R_{E-1-1} is H when E^1 is $C(R_{E-1-1})_2$;

Each R_{E-1} is independently H, alkyl, substituted alkyl, haloalkyl, cycloalkyl, heterocycloalkyl, or a bond to E^1 provided that E^1 is CR_{E-1-1};

E^2 is O, CR_{E-2-2}, or $C(R_{E-2-2})_2$, provided that when E^2 is CR_{E-2-2}, one R_{E-2} is a bond to CR_{E-2-2}, and further provided that at least one of E^1 or E^2 is O;

Each R_{E-2-2} is independently H, F, Br, Cl, CN, alkyl, haloalkyl, substituted alkyl, alkynyl, cycloalkyl, $-OR_E$, or $-N(R_E)_2$, provided that at least one R_{E-2-2} is H when E^2 is $C(R_{E-2-2})_2$;

Each R_{E-2} is independently H, alkyl, substituted alkyl, haloalkyl, cycloalkyl, heterocycloalkyl, or a bond to E^2 provided that E^2 is CR_{E-2-2};

Each R_E is independently H, alkyl, cycloalkyl, heterocycloalkyl, haloalkyl, halocycloalkyl, or haloheterocycloalkyl;

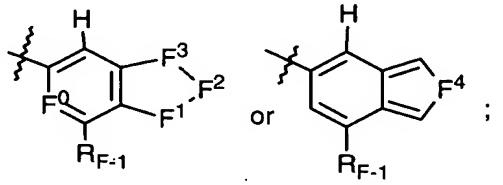
Each R_{E-3} is independently H, alkyl, haloalkyl, substituted alkyl, cycloalkyl, halocycloalkyl, substituted cycloalkyl, heterocycloalkyl, haloheterocycloalkyl, substituted heterocycloalkyl, R_5, R_6, phenyl, or phenyl having 1 substituent selected from R_9 and further having 0-3 substituents independently selected from F, Cl, Br, or I or substituted phenyl;

R_{E-4} is H, haloalkyl, substituted alkyl, cycloalkyl, halocycloalkyl, substituted cycloalkyl, heterocycloalkyl, haloheterocycloalkyl, substituted heterocycloalkyl, R_5, R_6, phenyl, or substituted phenyl;

Each R_{E-5} is independently H, haloalkyl, substituted alkyl, cycloalkyl, halocycloalkyl, substituted cycloalkyl, heterocycloalkyl, haloheterocycloalkyl, substituted heterocycloalkyl, R_5, or R_6;

Each R_{E-6} is independently alkyl, haloalkyl, substituted alkyl, cycloalkyl, halocycloalkyl, substituted cycloalkyl, heterocycloalkyl, haloheterocycloalkyl, substituted heterocycloalkyl, R_5, R_6, phenyl, or phenyl having 1 substituent selected from R_9 and further having 0-3 substituents independently selected from F, Cl, Br, or I;

wherein W is (F):



(F-1) (F-2)

F^0 is C(H), wherein F^1---F^2---F^3 is selected from O-C(R_{F-2})=N, O-C(R_{F-3})(R_{F-2})-N(R_{F-4}), O-C(R_{F-3})(R_{F-2})-S, O-N=C(R_{F-3}), O-C(R_{F-2})(R_{F-3})-O, S-C(R_{F-2})=N, S-C(R_{F-3})(R_{F-2})-N(R_{F-4}), S-N=C(R_{F-3}), N=C(R_{F-2})-O, N=C(R_{F-2})-S, N=C(R_{F-2})-N(R_{F-4}), N(R_{F-4})-N=C(R_{F-3}), N(R_{F-4})-C(R_{F-3})(R_{F-2})-O, N(R_{F-4})-C(R_{F-3})(R_{F-2})-S, N(R_{F-4})-C(R_{F-3})(R_{F-2})-N(R_{F-4}), C(R_{F-3})$_2$-O-N(R_{F-4}), C(R_{F-3})$_2$-N(R_{F-4})-O, C(R_{F-3})$_2$-N(R_{F-4})-S, C(R_{F-3})=N-O, C(R_{F-3})=N-S, C(R_{F-3})=N-N(R_{F-4}), or C(R_{F-3})$_2$-C(R_{F-2})(R_{F-3})-C(R_{F-3})$_2$; or

F^0 is N, wherein F^1---F^2---F^3 is selected from O-C(R_{F-2})=N, O-C(R_{F-3})(R_{F-2})-N(R_{F-4}), O-C(R_{F-3})(R_{F-2})-S, O-N=C(R_{F-3}) O-C(R_{F-2})(R_{F-3})-O, S-C(R_{F-2})=N, S-C(R_{F-3})(R_{F-2})-N(R_{F-4}), S-N=C(R_{F-3}), N=C(R_{F-2})-O, N=C(R_{F-2})-S, N=C(R_{F-2})-N(R_{F-4}), N(R_{F-4})-N=C(R_{F-3}), N(R_{F-4})-C(R_{F-3})(R_{F-2})-O, N(R_{F-4})-C(R_{F-3})(R_{F-2})-S, N(R_{F-4})-C(R_{F-3})(R_{F-2})-N(R_{F-4}), C(R_{F-3})$_2$-O-N(R_{F-4}), C(R_{F-3})$_2$-N(R_{F-4})-O, C(R_{F-3})$_2$-N(R_{F-4})-S, C(R_{F-3})=N-O, C(R_{F-3})=N-S, C(R_{F-3})=N-N(R_{F-4}), C(R_{F-3})=C(R_{F-2})-C(R_{F-3})$_2$, or C(R_{F-3})$_2$-C(R_{F-2})(R_{F-3})-C(R_{F-3})$_2$;

F^4 is N(R_{F-7}), O, or S;

R_{F-1} is H, F, Cl, Br, I, -CN, -CF_3, -OR_{F-8}, -SR_{F-8}, or -N(R_{F-8})$_2$;

R_{F-2} is H, F, alkyl, haloalkyl, substituted alkyl, lactam heterocycloalkyl, phenoxy, substituted phenoxy, R_5, R_6, -N(R_{F-4})-aryl, -N(R_{F-4})-substituted phenyl, -N(R_{F-4})-substituted naphthyl, -O-substituted phenyl, -O-substituted naphthyl, -S-substituted phenyl, -S-substituted naphthyl, or alkyl substituted on the ω carbon with R_{F-9};

R_{F-3} is H, F, Br, Cl, I, alkyl, substituted alkyl, haloalkyl, alkenyl, substituted alkenyl, haloalkenyl, alkynyl, substituted alkynyl, haloalkynyl, heterocycloalkyl, substituted heterocycloalkyl, lactam heterocycloalkyl, -CN, $-NO_2$, $-OR_{F-8}$, $-C(O)N(R_{F-8})_2$, $-NHR_{F-8}$, $-NR_{F-8}COR_{F-8}$, $-N(R_{F-8})_2$, $-SR_{F-8}$, $-C(O)R_{F-8}$, $-CO_2R_{F-8}$, aryl, R_5, or R_6;

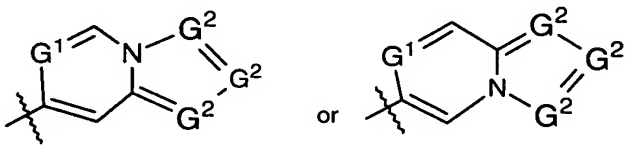
R_{F-4} is H, or alkyl;

R_{F-7} is H, alkyl, haloalkyl, substituted alkyl, cycloalkyl, halocycloalkyl, substituted cycloalkyl, phenyl, or phenyl having 1 substituent selected from R_9 and further having 0-3 substituents independently selected from F, Cl, Br, or I;

R_{F-8} is H, alkyl, substituted alkyl, cycloalkyl, haloalkyl, heterocycloalkyl, substituted heterocycloalkyl, substituted phenyl, or substituted naphthyl;

R_{F-9} is aryl, R_5, or R_6;

wherein W is (G):



G^1 is N or CH;

Each G^2 is N or $C(R_{G-1})$, provided that no more than one G^2 is N, and further provided that when G^2 adjacent to the bridge N is $C(R_{G-1})$ and the other G^2 are CH, that R_{G-1} is other than H, F, Cl, I, alkyl, substituted alkyl or alkynyl;

Each R_{G-1} is independently H, alkyl, substituted alkyl, haloalkyl, alkenyl, substituted alkenyl, haloalkenyl, alkynyl, substituted alkynyl, haloalkynyl, -CN, $-NO_2$, F, Br, Cl, I, $-C(O)N(R_{G-3})_2$, $-N(R_{G-3})_2$, $-SR_{G-6}$, $-S(O)_2R_{G-6}$, $-OR_{G-6}$, $-C(O)R_{G-6}$, $-CO_2R_{G-6}$, aryl, R_5, R_6, or two R_{G-1} on adjacent carbon atoms may combine for W to be a 6-5-6 fused-tricyclic-heteroaromatic-ring system optionally substituted on the newly formed ring where valency allows with 1-2 substitutents independently selected from F, Cl, Br, I, and R_{G-2};

R_{G-2} is alkyl, alkenyl, alkynyl, cycloalkyl, heterocycloalkyl, haloalkyl, haloalkenyl, haloalkynyl, halocycloalkyl, haloheterocycloalkyl, $-OR_{G-8}$, $-SR_{G-8}$, $-S(O)_2R_{G-8}$, $-S(O)R_{G-8}$, $-OS(O)_2R_{G-8}$, $-N(R_{G-8})_2$, $-C(O)R_{G-8}$, $-C(S)R_{G-8}$, $-C(O)OR_{G-8}$, -CN, $-C(O)N(R_{G-8})_2$, $-NR_{G-8}C(O)R_{G-8}$, $-S(O)_2N(R_{G-8})_2$, $-NR_{G-8}S(O)_2R_{G-8}$, $-NO_2$,

$-N(R_{G-8})C(O)N(R_{G-8})_2$, substituted alkyl, substituted alkenyl, substituted alkynyl, substituted cycloalkyl, substituted heterocycloalkyl, lactam heterocycloalkyl, phenyl, phenyl having 0-4 substituents independently selected from F, Cl, Br, I and R_{G-7}, naphthyl, or naphthyl having 0-4 substituents independently selected from F, Cl, Br, I, or R_{G-7};

Each R_{G-3} is independently H, alkyl, cycloalkyl, heterocycloalkyl, alkyl substituted with 1 substituent selected from R_{G-4}, cycloalkyl substituted with 1 substituent selected from R_{G-4}, heterocycloalkyl substituted with 1 substituent selected from R_{G-4}, haloalkyl, halocycloalkyl, haloheterocycloalkyl, phenyl, or substituted phenyl;

R_{G-4} is $-OR_{G-5}$, $-SR_{G-5}$, $-N(R_{G-5})_2$, $-C(O)R_{G-5}$, $-SOR_{G-5}$, $-SO_2R_{G-5}$, $-C(O)N(R_{G-5})_2$, -CN, $-CF_3$, $-NR_{G-5}C(O)R_{G-5}$, $-S(O)_2N(R_{G-5})_2$, $-NR_{G-5}S(O)_2R_{G-5}$, or $-NO_2$;

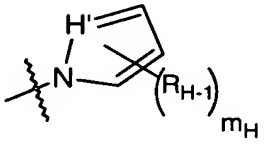
Each R_{G-5} is independently H, alkyl, cycloalkyl, heterocycloalkyl, haloalkyl, halocycloalkyl, or haloheterocycloalkyl;

R_{G-6} is H, alkyl, haloalkyl, substituted alkyl, cycloalkyl, halocycloalkyl, substituted cycloalkyl, phenyl, or phenyl having 0-4 substituents independently selected from F, Cl, Br, I, and R_{G-7};

R_{G-7} is alkyl, substituted alkyl, haloalkyl, $-OR_{G-5}$, -CN, $-NO_2$, $-N(R_{G-3})_2$;

Each R_{G-8} is independently H, alkyl, haloalkyl, substituted alkyl, cycloalkyl, halocycloalkyl, substituted cycloalkyl, heterocycloalkyl, haloheterocycloalkyl, substituted heterocycloalkyl, phenyl, or phenyl substituted with 0-4 independently selected from F, Cl, Br, I, or R_{G-7};

wherein W is (H)



H' is N or CH;

Each R_{H-1} is independently F, Cl, Br, I, -CN, $-NO_2$, alkyl, haloalkyl, substituted alkyl, alkenyl, haloalkenyl, substituted alkenyl, alkynyl, haloalkynyl, substituted alkynyl, cycloalkyl, halocycloalkyl, substituted cycloalkyl,

heterocycloalkyl, haloheterocyloalkyl, substituted heterocycloalkyl, lactam heterocyclcoalkyl, aryl, R_5, R_6, $-OR_{H-3}$, $-SR_{H-3}$, $-SOR_{H-3}$, $-SO_2R_{H-3}$, -SCN, $-S(O)N(R_{H-3})_2$, $-S(O)_2N(R_{H-3})_2$, $-C(O)R_{H-3}$, $-C(O)_2R_{H-3}$, $-C(O)N(R_{H-3})_2$, $-C(R_{H-3})=N-OR_{H-3}$, $-NC(O)R_{H-3}$, $-NC(O)R_{H-3}$, $-NC(O)R_{H-3}$, $-N(R_{H-3})_2$, $-NR_{H-3}C(O)R_{H-3}$, $-NR_{H-3}S(O)_2R_{H-3}$, or two R_{H-1} on adjacent carbon atoms may fuse to form a 6-membered ring to give a 5-6 fused, bicyclic moiety where the 6-membered ring is optionally substituted with 1-3 substitutents selected from R_{H-2};

m_H is 0, 1, or 2;

R_{H-2} is alkyl, alkenyl, alkynyl, cycloalkyl, heterocycloalkyl, haloalkyl, haloalkenyl, haloalkynyl, halocycloalkyl, haloheterocycloalkyl, $-OR_{H-3}$, $-SR_{H-3}$, $-S(O)_2R_{H-3}$, $-S(O)R_{H-3}$, $-OS(O)_2R_{H-3}$, $-N(R_{H-3})_2$, $-C(O)R_{H-3}$, $-C(S)R_{H-3}$, $-C(O)OR_{H-3}$, -CN, $-C(O)N(R_{H-3})_2$, $-NR_{H-3}C(O)R_{H-3}$, $-S(O)_2N(R_{H-3})_2$, $-NR_{H-3}S(O)_2R_{H-3}$, $-NO_2$, $-N(R_{H-3})C(O)N(R_{H-3})_2$, substituted alkyl, substituted alkenyl, substituted alkynyl, substituted cycloalkyl, substituted heterocycloalkyl, lactam heterocycloalkyl, phenyl, phenyl having 0-4 substituents independently selected from F, Cl, Br, I and R_7, naphthyl, naphthyl having 0-4 substituents independently selected from F, Cl, Br, I, or R_7, or two R_{H-2} on adjacent carbon atoms may combine to form a three-ring-fused-5-6-6 system optionally substituted with up to 3 substituents independently selected from Br, Cl, F, I, -CN, $-NO_2$, $-CF_3$, $-N(R_{H-3})_2$, $-N(R_{H-3})C(O)R_{H-3}$, alkyl, alkenyl, and alkynyl;

Each R_{H-3} is independently H, alkyl, haloalkyl, substituted alkyl, cycloalkyl, halocycloalkyl, substituted cycloalkyl, heterocycloalkyl, haloheterocycloalkyl, substituted heterocycloalkyl, phenyl, or phenyl substituted with 0-4 independently selected from F, Cl, Br, I, or R_7;

pharmaceutically acceptable salt, racemic mixture, or pure enantiomer thereof; and provided that the compound of Formula I includes at least one isotopic label.

2. The compound of claim 1, wherein R_2 is H or CH_3, each R_3 is H, and R_4 is H.

3. The compound of claim 2, wherein W is 4-chlorobenz-1-yl; dibenzo[b,d]thiophene-2-yl; isoquinoline-3-yl; furo[2,3-c]pyridine-5-yl; 1,3-benzodioxole-5-yl; 2,3-dihydro-1,4-benzodioxine-6-yl; 1,3-benzoxazole-5-yl; thieno[2,3-c]pyridine-5-yl; thieno[3,2-c]pyridine-6-yl; [1]benzothieno[3,2-c]pyridine-

3-yl; 1,3-benzothiazole-6-yl; thieno[3,4-c]pyridine-6-yl; 2,3-dihydro-1-benzofuran-5-yl; 1-benzofuran-5-yl; furo[3,2-c]pyridine-6-yl; [1]benzothieno[2,3-c]pyridine-3-yl; dibenzo[b,d]furan-2-yl; 1-benzofuran-6-yl; 2-naphthyl; 1H-indole-6-yl; pyrrolo[1,2-c]pyrimidine-3-yl; 1-benzothiophene-5-yl; 1-benzothiophene-5-yl; 1-benzothiophene-6-yl; pyrrolo[1,2-a]pyrazine-3-yl; 1H-indole-6-yl; pyrazino[1,2-a]indole-3-yl; 1,3-benzothiazole-6-yl; [1]benzofuro[2,3-c]pyridine-3-yl; [1]benzofuro[2,3-c]pyridine-3-yl; 2H-chromene-6-yl; indolizine-6-yl; and [1,3]dioxolo[4,5-c]pyridine-6-yl; any of which is optionally substituted as allowed in claim 1.

4. The compound of claim 2, wherein W is thiophene-2-yl, furan-2-yl, pyrrole-2-yl, 1,3-oxazole-2-yl, 1,3-thiazole-2-yl, isoxazole-3-yl, isothiazole-3-yl; any of which is optionally substituted at the 5 position on the ring as allowed in formula I, and 1,3-oxazole-4-yl, 1,3-oxazole-5-yl, 1,3-thiazole-4-yl, 1,3-thiazole-5-yl; any of which is optionally substituted at the 2 position on the ring as allowed in claim 1.

5. The compound of claim 2, wherein the compound is:

N-[(3R)-1-azabicyclo[2.2.2]oct-3-yl]-1-benzofuran-5-[^{11}C]carboxamide;

N-[(2S,3R)-2-methyl-1-azabicyclo[2.2.2]oct-3-yl]-1-benzofuran-5-[^{11}C]carboxamide;

N-[(3R,5R)-1-azabicyclo[3.2.1]oct-3-yl]-1-benzofuran-5-[^{11}C]carboxamide;

N-[(3R)-1-azabicyclo[2.2.2]oct-3-yl]-2-methyl-1-benzofuran-5-[^{11}C]carboxamide;

N-[(2S,3R)-2-methyl-1-azabicyclo[2.2.2]oct-3-yl]-2-methyl-1-benzofuran-5-[^{11}C]carboxamide;

N-[(3R,5R)-1-azabicyclo[3.2.1]oct-3-yl]-2-methyl-1-benzofuran-5-[^{11}C]carboxamide;

N-[(3R)-1-azabicyclo[2.2.2]oct-3-yl]furo[2,3-c]pyridine-5-[^{11}C]carboxamide;

N-[(2S,3R)-2-methyl-1-azabicyclo[2.2.2]oct-3-yl]furo[2,3-c]pyridine-5-[^{11}C]carboxamide;

N-[(2R)-7-azabicyclo[2.2.1]hept-2-yl]furo[2,3-c]pyridine-5-[^{11}C]carboxamide;

N-[(3R,5R)-1-azabicyclo[3.2.1]oct-3-yl]furo[2,3-c]pyridine-5-[^{11}C]carboxamide;

N-[(3S)-1-azabicyclo[2.2.2]oct-3-yl]-3-methylfuro[2,3-c]pyridine-5-[^{11}C]carboxamide;

N-[(3R)-1-azabicyclo[2.2.2]oct-3-yl]-5-bromothiophene-2-[^{11}C]carboxamide;

5-bromo-N-[(2S,3R)-2-methyl-1-azabicyclo[2.2.2]oct-3-yl]thiophene-2-[^{11}C]carboxamide;

N-[(3R)-1-azabicyclo[2.2.2]oct-3-yl]-5-pyridin-2-ylthiophene-2-[^{11}C]carboxamide;

N-[(2S,3R)-2-methyl-1-azabicyclo[2.2.2]oct-3-yl]-5-pyridin-2-ylthiophene-2-[^{11}C]carboxamide;

N-[(3R)-1-azabicyclo[2.2.2]oct-3-yl]-5-(methylthio)thiophene-2-[^{11}C]carboxamide;

N-[(2S,3R)-2-methyl-1-azabicyclo[2.2.2]oct-3-yl]-5-(methylthio)thiophene-2-[^{11}C]carboxamide;

N-[(3R)-1-azabicyclo[2.2.2]oct-3-yl]-5-phenylthiophene-2-[^{11}C]carboxamide;

N-[(3R)-1-azabicyclo[2.2.2]oct-3-yl]-5-methoxythiophene-2-[^{11}C]carboxamide;

N-[(2S,3R)-2-methyl-1-azabicyclo[2.2.2]oct-3-yl]-5-methoxythiophene-2-[^{11}C]carboxamide;

N-[(3R)-1-azabicyclo[2.2.2]oct-3-yl]-5-nitrothiophene-2-[^{11}C]carboxamide;

N-[(2S,3R)-2-methyl-1-azabicyclo[2.2.2]oct-3-yl]-5-nitrothiophene-2-[^{11}C]carboxamide;

N-[(3R)-1-azabicyclo[2.2.2]oct-3-yl]-5-(2-[^{18}F]fluorophenyl)-2-furamide;

5-(2-[^{18}F]fluorophenyl)-N-[(2S,3R)-2-methyl-1-azabicyclo[2.2.2]oct-3-yl]-2-furamide;

N-[(3R)-1-azabicyclo[2.2.2]oct-3-yl]-4-[^{123}I]iodo-1H-pyrazole-1-carboxamide;

N-[(2S,3R)-2-methyl-1-azabicyclo[2.2.2]oct-3-yl]-4-[^{123}I]iodo-1H-pyrazole-1-carboxamide;

N-[(3R,5R)-1-azabicyclo[3.2.1]oct-3-yl]-4-[^{123}I]iodo-1H-pyrazole-1-carboxamide; or pharmaceutically acceptable salts thereof.

6. The compound of claim 2, wherein the compound is

N-[(3R)-1-azabicyclo[2.2.2]oct-3-yl]-1-benzofuran-5-[^{13}C]carboxamide;

N-[(2S,3R)-2-methyl-1-azabicyclo[2.2.2]oct-3-yl]-1-benzofuran-5-[^{13}C]carboxamide;

N-[(3R,5R)-1-azabicyclo[3.2.1]oct-3-yl]-1-benzofuran-5-[^{13}C]carboxamide;

N-[(3R)-1-azabicyclo[2.2.2]oct-3-yl]-2-methyl-1-benzofuran-5-[^{13}C]carboxamide;

N-[(2S,3R)-2-methyl-1-azabicyclo[2.2.2]oct-3-yl]-2-methyl-1-benzofuran-5-[^{13}C]carboxamide;

N-[(3R,5R)-1-azabicyclo[3.2.1]oct-3-yl]-2-methyl-1-benzofuran-5-[^{13}C]carboxamide;

N-[(3R)-1-azabicyclo[2.2.2]oct-3-yl]furo[2,3-c]pyridine-5-[^{13}C]carboxamide;

N-[(2S,3R)-2-methyl-1-azabicyclo[2.2.2]oct-3-yl]furo[2,3-c]pyridine-5-[^{13}C]carboxamide;

N-[(2R)-7-azabicyclo[2.2.1]hept-2-yl]furo[2,3-c]pyridine-5-[^{13}C]carboxamide;

N-[(3R,5R)-1-azabicyclo[3.2.1]oct-3-yl]furo[2,3-c]pyridine-5-[^{13}C]carboxamide;

N-[(3S)-1-azabicyclo[2.2.2]oct-3-yl]-3-methylfuro[2,3-c]pyridine-5-[^{13}C]carboxamide;

N-[(3R)-1-azabicyclo[2.2.2]oct-3-yl]-5-bromothiophene-2-[^{13}C]carboxamide;

5-bromo-N-[(2S,3R)-2-methyl-1-azabicyclo[2.2.2]oct-3-yl]thiophene-2-[^{13}C]carboxamide;

N-[(3R)-1-azabicyclo[2.2.2]oct-3-yl]-5-pyridin-2-ylthiophene-2-[^{13}C]carboxamide;

N-[(2S,3R)-2-methyl-1-azabicyclo[2.2.2]oct-3-yl]-5-pyridin-2-ylthiophene-2-[^{13}C]carboxamide;

N-[(3R)-1-azabicyclo[2.2.2]oct-3-yl]-5-(methylthio)thiophene-2-[^{13}C]carboxamide;

N-[(2S,3R)-2-methyl-1-azabicyclo[2.2.2]oct-3-yl]-5-(methylthio)thiophene-2-[^{13}C]carboxamide;

N-[(3R)-1-azabicyclo[2.2.2]oct-3-yl]-5-phenylthiophene-2-[^{13}C]carboxamide;

N-[(3R)-1-azabicyclo[2.2.2]oct-3-yl]-5-methoxythiophene-2-[^{13}C]carboxamide;

N-[(2S,3R)-2-methyl-1-azabicyclo[2.2.2]oct-3-yl]-5-methoxythiophene-2-[^{13}C]carboxamide;

N-[(3R)-1-azabicyclo[2.2.2]oct-3-yl]-5-nitrothiophene-2-[^{13}C]carboxamide;

N-[(2S,3R)-2-methyl-1-azabicyclo[2.2.2]oct-3-yl]-5-nitrothiophene-2-[^{13}C]carboxamide;

N-[(3R)-1-azabicyclo[2.2.2]oct-3-yl]-5-(2-[^{19}F]fluorophenyl)-2-furamide;

5-(2-[^{19}F]fluorophenyl)-N-[(2S,3R)-2-methyl-1-azabicyclo[2.2.2]oct-3-yl]-2-furamide; or pharmaceutically acceptable salts thereof

7. A method for imaging and quantifying a compound of claim 1 in a subject, wherein said compound in the subject is indicative of the presence of selective nAChR in the subject.

8. The method of claim 7, wherein the compound is detected using position emission topography.

9. The method of Claim 8, wherein the compound is

N-[(3R)-1-azabicyclo[2.2.2]oct-3-yl]-1-benzofuran-5-[^{11}C]carboxamide;

N-[(2S,3R)-2-methyl-1-azabicyclo[2.2.2]oct-3-yl]-1-benzofuran-5-[^{11}C]carboxamide;

N-[(3R,5R)-1-azabicyclo[3.2.1]oct-3-yl]-1-benzofuran-5-[^{11}C]carboxamide;

N-[(3R)-1-azabicyclo[2.2.2]oct-3-yl]-2-methyl-1-benzofuran-5-[^{11}C]carboxamide;

N-[(2S,3R)-2-methyl-1-azabicyclo[2.2.2]oct-3-yl]-2-methyl-1-benzofuran-5-[^{11}C]carboxamide;

N-[(3R,5R)-1-azabicyclo[3.2.1]oct-3-yl]-2-methyl-1-benzofuran-5-[^{11}C]carboxamide;

N-[(3R)-1-azabicyclo[2.2.2]oct-3-yl]furo[2,3-c]pyridine-5-[^{11}C]carboxamide;

N-[(2S,3R)-2-methyl-1-azabicyclo[2.2.2]oct-3-yl]furo[2,3-c]pyridine-5-[^{11}C]carboxamide;

N-[(2R)-7-azabicyclo[2.2.1]hept-2-yl]furo[2,3-c]pyridine-5-[^{11}C]carboxamide;

N-[(3R,5R)-1-azabicyclo[3.2.1]oct-3-yl]furo[2,3-c]pyridine-5-[^{11}C]carboxamide;

N-[(3S)-1-azabicyclo[2.2.2]oct-3-yl]-3-methylfuro[2,3-c]pyridine-5-[^{11}C]carboxamide;

N-[(3R)-1-azabicyclo[2.2.2]oct-3-yl]-5-bromothiophene-2-[^{11}C]carboxamide;

5-bromo-N-[(2S,3R)-2-methyl-1-azabicyclo[2.2.2]oct-3-yl]thiophene-2-[^{11}C]carboxamide;

N-[(3R)-1-azabicyclo[2.2.2]oct-3-yl]-5-pyridin-2-ylthiophene-2-[^{11}C]carboxamide;

N-[(2S,3R)-2-methyl-1-azabicyclo[2.2.2]oct-3-yl]-5-pyridin-2-ylthiophene-2-[^{11}C]carboxamide;

N-[(3R)-1-azabicyclo[2.2.2]oct-3-yl]-5-(methylthio)thiophene-2-[^{11}C]carboxamide;

N-[(2S,3R)-2-methyl-1-azabicyclo[2.2.2]oct-3-yl]-5-(methylthio)thiophene-2-[^{11}C]carboxamide;

N-[(3R)-1-azabicyclo[2.2.2]oct-3-yl]-5-phenylthiophene-2-[^{11}C]carboxamide;

N-[(3R)-1-azabicyclo[2.2.2]oct-3-yl]-5-methoxythiophene-2-[^{11}C]carboxamide;

N-[(2S,3R)-2-methyl-1-azabicyclo[2.2.2]oct-3-yl]-5-methoxythiophene-2-[^{11}C]carboxamide;

N-[(3R)-1-azabicyclo[2.2.2]oct-3-yl]-5-nitrothiophene-2-[^{11}C]carboxamide;

N-[(2S,3R)-2-methyl-1-azabicyclo[2.2.2]oct-3-yl]-5-nitrothiophene-2-[^{11}C]carboxamide;

N-[(3R)-1-azabicyclo[2.2.2]oct-3-yl]-5-(2-[^{18}F]fluorophenyl)-2-furamide;

5-(2-[^{18}F]fluorophenyl)-N-[(2S,3R)-2-methyl-1-azabicyclo[2.2.2]oct-3-yl]-2-furamide; or pharmaceutically acceptable salts thereof.

10. The method of claim 8, wherein the compound is

N-[(3R)-1-azabicyclo[2.2.2]oct-3-yl]-1-benzofuran-5-[^{11}C]carboxamide;

N-[(2S,3R)-2-methyl-1-azabicyclo[2.2.2]oct-3-yl]-1-benzofuran-5-[^{11}C]carboxamide;

N-[(3R,5R)-1-azabicyclo[3.2.1]oct-3-yl]-1-benzofuran-5-[^{11}C]carboxamide;

N-[(3R)-1-azabicyclo[2.2.2]oct-3-yl]-2-methyl-1-benzofuran-5-[^{11}C]carboxamide;

N-[(2S,3R)-2-methyl-1-azabicyclo[2.2.2]oct-3-yl]-2-methyl-1-benzofuran-5-[^{11}C]carboxamide;

N-[(3R,5R)-1-azabicyclo[3.2.1]oct-3-yl]-2-methyl-1-benzofuran-5-[^{11}C]carboxamide;

N-[(3R)-1-azabicyclo[2.2.2]oct-3-yl]furo[2,3-c]pyridine-5-[^{11}C]carboxamide;

N-[(2S,3R)-2-methyl-1-azabicyclo[2.2.2]oct-3-yl]furo[2,3-c]pyridine-5-[^{11}C]carboxamide;

N-[(2R)-7-azabicyclo[2.2.1]hept-2-yl]furo[2,3-c]pyridine-5-[^{11}C]carboxamide;

N-[(3R,5R)-1-azabicyclo[3.2.1]oct-3-yl]furo[2,3-c]pyridine-5-[^{11}C]carboxamide;

N-[(3S)-1-azabicyclo[2.2.2]oct-3-yl]-3-methylfuro[2,3-c]pyridine-5-[^{11}C]carboxamide; or pharmaceutically acceptable salts thereof.

11. The method of claim 7, wherein the compound is detected using single-photon emission computed tomography.

12. The method of claim 11, wherein the compound is

N-[(3R)-1-azabicyclo[2.2.2]oct-3-yl]-4-[^{123}I]iodo-1H-pyrazole-1-carboxamide;

N-[(2S,3R)-2-methyl-1-azabicyclo[2.2.2]oct-3-yl]-4-[^{123}I]iodo-1H-pyrazole-1-carboxamide;

N-[(3R,5R)-1-azabicyclo[3.2.1]oct-3-yl]-4-[^{123}I]iodo-1H-pyrazole-1-carboxamide; or pharmaceutically acceptable salts thereof.

13. The method of claims 7, wherein the subject is a human patient.

14. The method of claim 7, wherein the detectably labeled compound comprises a moiety selected from the group consisting of ^{11}C, ^{18}F, ^{76}Br, ^{123}I and ^{125}I.

15. The method of claims 7, wherein the disease is Alzheimer's disease, neurodegeneration associated with diseases such as Alzheimer's disease, pre-senile dementia (mild cognitive impairment), senile dementia, Parkinson's disease or schizophrenia.

16. The method of claim 7, wherein the disease is psychosis, attention deficit disorder, attention deficit hyperactivity disorder, depression, anxiety, general anxiety disorder, post traumatic stress disorder, or mood and affective disorders.

17. The method of claim 7, wherein the disease is amyotrophic lateral sclerosis, borderline personality disorder, traumatic brain injury, or behavioral and cognitive problems in general and associated with brain tumors.

18. The method of claim 7, wherein the disease is AIDS dementia complex, dementia associated with Down's syndrome, dementia associated with Lewy Bodies, Huntington's disease, tardive dyskinesia, Pick's disease, dysregulation of food intake including bulemia and anorexia nervosa, withdrawal symptoms associated with smoking cessation and dependant drug cessation, Gilles de la Tourette's Syndrome, age-related macular degeneration, glaucoma, neurodegeneration associated with glaucoma, diabetic retinopathy, or symptoms associated with pain.